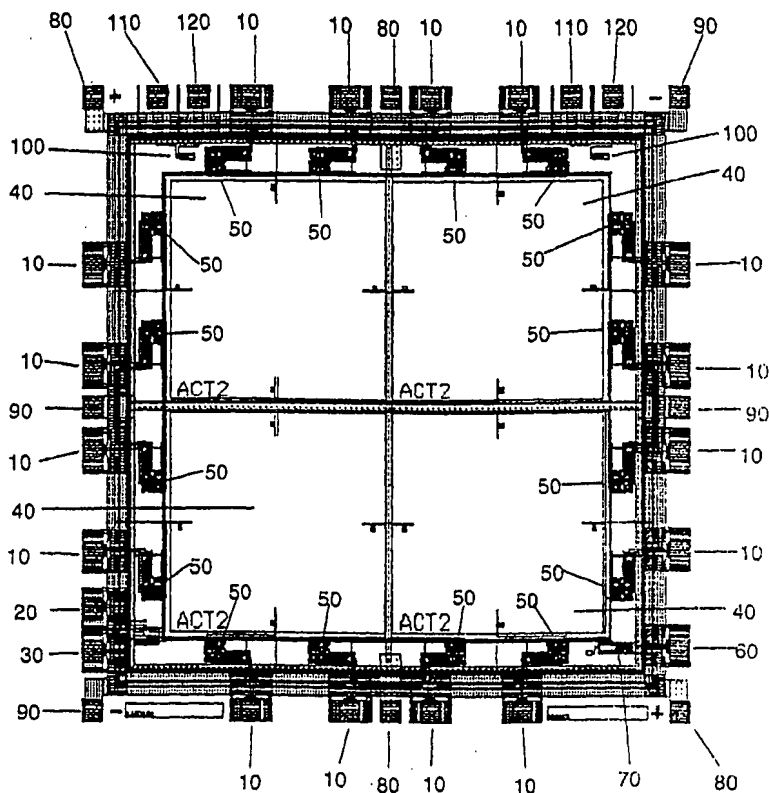




## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<b>(51) International Patent Classification <sup>7</sup> :</b>  <b>G11C</b>	<b>A2</b>	<b>(11) International Publication Number:</b> <b>WO 00/36608</b>  <b>(43) International Publication Date:</b> 22 June 2000 (22.06.00)
<b>(21) International Application Number:</b> PCT/US99/30326  <b>(22) International Filing Date:</b> 20 December 1999 (20.12.99)  <b>(30) Priority Data:</b> 60/112,787 18 December 1998 (18.12.98) US 09/465,592 17 December 1999 (17.12.99) US  <b>(71) Applicant:</b> LAZERUS NANO TECHNOLOGIES [US/US]; 43 Asilomar Circle, Oakland, CA 94611 (US).  <b>(72) Inventors:</b> RUST, Thomas, F.; 43 Asilomar Circle, Oakland, CA 94611 (US). CULVER, Joanne, P.; 43 Asilomar Circle, Oakland, CA 94611 (US).  <b>(74) Agents:</b> MEYER, Sheldon, R. et al.; Fliesler Dubb Meyer and Lovejoy LLP, Suite 400, Four Embarcadero Center, San Francisco, CA 94111-4156 (US).		<b>(81) Designated States:</b> JP, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).  <b>Published</b> <i>Without international search report and to be republished upon receipt of that report.</i>
<b>(54) Title:</b> MOLECULAR MEMORY MEDIUM AND MOLECULAR MEMORY INTEGRATED CIRCUIT		
<b>(57) Abstract</b>  <p>A molecular memory media having a media surface and a platform with read/write heads. The platform and media are moved to allow one of addition, removal, and repositioning of atoms, electrons, and charges on a surface of the media. The media is a material capable of storing data written to it, and detectable using a vibrating tip sensor that resonates at a free space value which is phase shifted when charges or anomalies on a surface of the media are present. Other methods of reading and writing to the media are presented. The media may be enhanced by augmenting grain boundaries of the media via deposition and removal of PMMA materials. Servo trenches and sync bits identify positions of the read/write heads and maintain alignment during memory operations.</p>		



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<b>(51) International Patent Classification 7 :</b> <b>G01B 7/34, H01J 3/14, 7/30, G11C 7/00, G11B 9/00</b>	<b>A3</b>	<b>(11) International Publication Number:</b> <b>WO 00/36608</b> <b>(43) International Publication Date:</b> 22 June 2000 (22.06.00)
<b>(21) International Application Number:</b> PCT/US99/30326 <b>(22) International Filing Date:</b> 20 December 1999 (20.12.99)  <b>(30) Priority Data:</b> 60/112,787 18 December 1998 (18.12.98) US 09/465,592 17 December 1999 (17.12.99) US  <b>(71) Applicant:</b> LAZERUS NANO TECHNOLOGIES [US/US]; 43 Asilomar Circle, Oakland, CA 94611 (US).  <b>(72) Inventors:</b> RUST, Thomas, F.; 43 Asilomar Circle, Oakland, CA 94611 (US). CULVER, Joanne, P.; 43 Asilomar Circle, Oakland, CA 94611 (US).  <b>(74) Agents:</b> MEYER, Sheldon, R. et al.; Fliesler Dubb Meyer and Lovejoy LLP, Suite 400, Four Embarcadero Center, San Francisco, CA 94111-4156 (US).		<b>(81) Designated States:</b> JP, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).  <b>Published</b> <i>With international search report.</i>  <b>(88) Date of publication of the international search report:</b> 14 September 2000 (14.09.00)
<b>(54) Title:</b> MOLECULAR MEMORY MEDIUM AND MOLECULAR MEMORY INTEGRATED CIRCUIT   <b>(57) Abstract</b> <p>A molecular memory media having a media surface (2300) and a platform with an electromagnetic radiation generating source (2310) and an electromagnetic radiation receptor (2320). The platform and media are moved to allow one of addition, removal, and repositioning of atoms, electrons, and charges on a surface of the media. The media is detectable using a vibrating tip sensor that resonates at a free space value which is phase shifted when charges or anomalies of reading and writing to the media are presented.</p>		

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## INTERNATIONAL SEARCH REPORT

 International application No.  
 PCT/US99/30326

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> IPC(7) : G01B 7/34; H01J 3/14, 7/30; G11C 7/00; G11B 9/00 US CL : Please See Extra Sheet. According to International Patent Classification (IPC) or to both national classification and IPC														
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) U.S. : 73/15; 250/306, 307, 492.2, 492.3; 365/112, 128, 151, 174; 369/101, 126, 176 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) East														
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>														
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.												
Y,E	US 6,038,916 A (CLEVELAND et al.) 21 March 2000, Fig. 1.	8, 10, 11, 13-23, 21-23, 27-29, 33, 36, 37, 40, 41, 43, 44, 46, 48, 50, 51, 53-57, 59 and 60												
X	US 5,453,970 A (RUST ET AL.) 26 September 1995, Fig. 1	1-60												
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.														
<table border="0"> <tr> <td>* Special categories of cited documents:</td> <td>*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</td> </tr> <tr> <td>*A* document defining the general state of the art which is not considered to be of particular relevance</td> <td>*X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</td> </tr> <tr> <td>*E* earlier document published on or after the international filing date</td> <td>*Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</td> </tr> <tr> <td>*L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</td> <td>*A* document member of the same patent family</td> </tr> <tr> <td>*O* document referring to an oral disclosure, use, exhibition or other means</td> <td></td> </tr> <tr> <td>*P* document published prior to the international filing date but later than the priority date claimed</td> <td></td> </tr> </table>			* Special categories of cited documents:	*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention	*A* document defining the general state of the art which is not considered to be of particular relevance	*X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone	*E* earlier document published on or after the international filing date	*Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art	*L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*A* document member of the same patent family	*O* document referring to an oral disclosure, use, exhibition or other means		*P* document published prior to the international filing date but later than the priority date claimed	
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Date of the actual completion of the international search 28 MARCH 2000		Date of mailing of the international search report 13 JUN 2000												
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## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US99/30326

## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,251,200 A (HATANAKA et al.) 05 October 1993, Fig. 2	8, 10, 11, 13-23, 27-29, 33, 36, 37, 40, 41, 43, 44, 46, 48, 50, 51, 53-57, 59 and 60
Y	US 5,216,631 A (SLIWA, JR.) 01 June 1993, Fig. 6.	8, 10, 11, 13-23, 27-29, 33, 36, 37, 40, 41, 43, 44, 46, 48, 50, 51, 53-57, 59 and 60.
X -- Y	US 5,187,367 A (MIYAZAKI et al.) 16 February 1993, Fig. 3.	1-7, 9, 12, 24-26, 30-32, 34, 35, 38, 39, 42, 45, 47, 49, 52, 58 ----- 8, 10, 11, 13-23, 27-29, 33, 36, 37, 40, 41, 43, 44, 46, 48, 50, 51, 53-57, 59, 60
X -- Y	US 4,987,312 A (EIGLER) 22 January 1991, Fig. 1:	1-7, 9, 12, 24-26, 30-32, 34, 35, 38, 39, 42, 45, 47, 49, 52, 58 ----- 8, 10, 11, 13-23, 27-29, 33, 36, 37, 40, 41, 43, 44, 46, 48, 50, 51, 53-57, 59, 60

**INTERNATIONAL SEARCH REPORT**

International application No.

PCT/US99/30326

**A. CLASSIFICATION OF SUBJECT MATTER:**

US CL :

73/15; 250/306, 307, 492.2, 492.3; 365/112, 128, 151, 174; 369/101, 126, 176